Policy Research

WORKING PAPERS

Financial Policy and Systems

Country Economics Department
The World Bank
October 1992
WPS 984

Barriers to Portfolio Investments in Emerging Stock Markets

Aslı Demirgüç-Kunt
and
Harry Huizinga

The capital gains withholding tax levied on foreign portfolio investors increases required pre-tax rates of return in developing countries, increasing domestic firms cost of capital and discouraging physical investment. Dividend withholding taxes do not have this effect since foreign investors can obtain offsetting tax credits.

Policy Research

WORKING PAPERS

Financial Policy and Systems

WPS 984

This paper — a product of the Financial Policy and Systems Division, Country Economics Department — is part of a larger effort in the Department to understand the impact of emerging stock markets in developing countries. Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact W. Patrawimolpon, room N9-043, extension 37664 (October 1992, 27 pages).

Demirgüç-Kunt and Huizinga examine to what extent features of the international tax system and indicators of transaction costs affect the required rates of return on emerging stock markets.

They show that the capital gains withholding tax levied on foreign portfolio investors increases required pre-tax rates of return. As countries generally do not index their capital gains taxes, it follows that inflation increases the capital gains tax base, as well as the required rate of return on equity.

Dividend withholding taxes instead appear not to increase the required pre-tax equity returns significantly. The differing results for capital gains and dividend taxes reflect the fact that foreign investors generally can receive domestic tax credits only for foreign withholding taxes paid on dividends.

The return on equity is part of the issuing firm's cost of capital. So, capital gains withholding taxes imposed on nonresidents increase the cost of capital for domestic firms and discourage physical investment. Private investment levels have tended to be low in developing countries in the 1980s. The cost of equity finance in developing countries has gained in importance in the last decade, as these countries' access to international lending capital has been limited during most of the decade.

What do these findings imply for the design of tax policy in relation to foreign portfolio investment in developing countries? The existence of foreign tax credits for dividend taxes paid suggests that a country should tax capital gains more lightly than repatriated dividends — as do Greece, Pakistan, Portugal, and Venezuela. Each of these countries has positive-dividend withholding taxes but no capital gains taxes imposed on nonresidents. Colombia and India do the exact opposite: they tax capital gains far more heavily than dividends. Despite what appears optimal, the trend in developing countries is toward lower dividend withholding taxes, with little change in the average level of capital gains taxation.

It also appears desirable for developing countries to index their capital gains taxes to prevent them from being higher than anticipated.

Produced by the Policy Research Dissemination Center

BARRIERS TO PORTFOLIO INVESTMENTS IN EMERGING STOCK MARKETS

Aslı Demirgüç-Kunt
The World Bank

and

Harry Huizinga*
Stanford University

July 1992

*This paper was written while the second author was a consultant in the Financial Policy and Systems Division of the World Bank.

Table of Contents

1. Introduction

If international capital markets are integrated then assets with equal distributions of returns in a particular currency should trade at the same price. The tendency of investors worldwide to hold primarily domestic securities, however, suggests that there exists significant barriers to international capital mobility. The presence of imperfect international capital markets has the important implication that the cost of equity finance depends on where the capital is raised.

A barrier to development in many developing countries in the 1980s has been inadequate levels of business investment. To the extent firms finance their marginal investment projects through the stock market, stock market performance influences investment incentives. Private sector investment will be low if required rates of return on equity are rather high, which are part of the overall cost of capital of the firm.

Singh et al. (1992) report that in developing countries corporations rely to a greater degree on external finance than firms in the developed world, and that equity finance plays a more central role in the growth of these corporations. For example, the median Korean company in their sample of top 50 manufacturing firms financed more than 40 percent of its growth from equity issues in the 1980s; the corresponding figure for the median Mexican corporation was over 75 percent and for the median corporation in Jordan over 80 percent. Dailami (1990) further documents a statistically significant correlation between stock market price movements and aggregate corporate real investment in Korea, although he finds no strong relationship between earnings and investment.

Black (1974) and Stulz (1981) model barriers to international portfolio investment as proportional taxes on foreign asset holdings. Black (1974) assumes the tax rate is positive for long positions and negative for short positions, while Stulz (1981) instead assumes a positive tax applies equally to all positions. Booth (1987) further examines how the differential taxation of dividends accruing to domestic and foreign residents affects the international ownership of equity capital. As an

alternative to the characterization of capital controls as taxes, Eun and Janakiramanan (1986), Errunza and Losq (1989) and Hietala (1989) model investment barriers as prohibitions on particular cross-ownerships of assets.

Empirical work on international capital barriers has generally not relied on an identification of which barriers are in existence and how they should be expected to affect asset returns. Instead a general approach has been to construct an international asset pricing model for the case of perfect capital markets, and then to test the restrictions of the model implied by international capital market integration. A rejection of these restrictions is taken as evidence of international market imperfections. Examples of this literature are Stehle (1977), Jorion and Schwartz (1986), Cho, Eun and Senbet (1986), and Wheatley (1988).

Even when specific investment barriers are identified, empirical testing of the impact of these barriers on international asset pricing has proven difficult, as it is difficult to incorporate the cost-equivalents of the range of international capital barriers into asset pricing models. The investment restrictions considered by Cho, Eun and Senbet (1986), Bosner-Neal, Brauer, Neal and Wheatley (1990), and Gultekin, Gultekin and Penati (1989), for instance, do not allow for a straightforward computation of tax or transaction cost equivalents. These authors instead examine how changes in the investment restrictions differentially affect the international pricing of assets and of risk.

This paper examines the role of (i) taxation and of (ii) proxies for other investment-related costs that affect stock market performance of developing countries. The paper first shows that differences in the national taxation of foreign portfolio investment significantly affect stock market returns. Second, it shows that the ratio of a country's stock market capitalization to GDP is a good indicator of other costs of portfolio investment in a certain country.

As in the original work of Black (1974) and Stulz (1981), investment barriers that take the form of taxes can be explicitly incorporated in an asset pricing model, and it is straightforward to see

how pre-tax returns on equity increase with any withholding taxes levied by the developing country. Hence, asset pricing for the case of perfect capital markets as well as its alternative are well specified. Proxies that capture direct transaction costs are also easily incorporated. The study examines stock market returns for 18 developing countries with emerging equity markets. The data is from the Emerging Markets Data Base constructed by the International Finance Corporation.

The extent to which withholding taxes affect pre-tax equity returns depends in part on whether foreign investors can obtain tax relief in the form of a tax credit or deduction from their national tax authorities. The developed countries, including the United States, generally provide tax relief in the form of a tax credit or deduction only for foreign dividend taxes. Hence, the withholding tax on foreign capital gains taxes tends to be a final tax that is fully borne by the foreign investor. To compensate the investor the pre-tax rate of return has to rise accordingly.

The main result of this paper is that capital gains taxes imposed on foreign residents increase the required pre-tax rates of return, while withholding taxes on dividends do not. Most countries do not index their capital gains taxes to adjust for inflation. Thus inflation by itself increases the capital gains tax base, and the necessary pre-tax rate of return on equity. This paper shows that the taxation of purely infationary capital gains indeed has an independent positive impact on the required rate of return on equity in emerging stock markets. The capital gains tax burden related to inflation are in addition to any other inflation costs borne by the private sector.

The remainder of this paper is organized as follows. Section 2 sets out a version of the mean-variance international asset pricing model that includes dividend and capital gains witholding taxes. Section 3 describes the data, while section 4 presents the empirical results. Section 5 concludes by discussing the implications of the paper for investment and for taxation policy in developing countries.

2. The model

The model takes the perspective of a U.S. private or institutional investor. The investor can invest freely in the U.S. and foreign developed and developing country equity markets. In addition, the investor can borrow and lend at the risk-free dollar interest rate R. There are no international investment barriers other than the domestic and foreign taxation of the returns to international equity investments. The U.S. investor is assumed to be invested in a number of developing country emerging stock markets. A differential rate of taxation of domestic and foreign equity returns will then give rise to different pre-tax rates of return for foreign and domestic assets with perfectly correlated returns in a common currency. This section incorporates several features of the double taxation of foreign equity returns in the mean-variance asset pricing model originated by Sharpe (1964) and Lintner (1965). The presence of double taxation gives rise to the addition of several tax burden terms in the mean-variance capital asset pricing equation. An empirical significance of any of these terms implies the presence of tax barriers to international capital market integration. Empirical tests of the model are presented in section 4.

The U.S. investor's foreign equity returns are first taxed abroad. In particular, country i taxes the U.S. investor's dividends at a rate τ_i^d, while capital gains, measured in local currency, are taxed at a rate τ_i^c. For purposes of assessing the capital gains tax burden, it is assumed that capital gains are realized each period.[1] In addition to foreign taxes, the investor is subject to a U.S. personal (or corporate) income tax at a rate τ_{us}. Interest income is taxable in the U.S., while interest expenses are fully deductible from U.S. taxable income.[2] Finally, the U.S. investor generally can claim a U.S. tax credit for foreign taxes paid to lessen the burden of double taxation. U.S. (and other developed country) foreign tax credits tend to be limited to foreign dividend taxes, and even there several limitations apply.[3] Generally let γ_c and γ_d be the shares of foreign capital gains and dividend taxes paid that are eligible for a U.S. credit. $\theta_c=1-\gamma_c$ and $\theta_d=1-\gamma_d$ then are the incidences

of the foreign capital gains tax and dividend taxes on U.S. investor - for a given pre-tax rate of return. For a small country that faces a perfectly elastic demand for its securities, the pre-tax rate of return on equity then has to rise by the incidence rates times the assessed capital gains and dividend tax burdens to compensate the foreign investor. For this case, the incidence of any foreign taxes on the U.S. investor ultimately lies with the U.S. Treasury or the foreign country itself.

Apart from taxes, differences in international transaction costs can give rise to differences in net equity returns across countries. Let c_i denote the dollar transactions costs per dollar invested in market i per period. The transaction cost can be a brokerage fee or other costs such as legal costs necessary to protect the investor's assets. Differences in transactions costs may hence reflect differences in legal or accounting rules. The starting point of the analysis is the following standard capital asset pricing relationship

$$ER_i^a - R = \beta_i (ER_m^a - R) \tag{1}$$

where ER_i^a is the expected dollar return on equity in country i after all taxes and transaction costs[4]

ER_m^a is the expected dollar return from the world portfolio which includes all countries' equities in proportion to their market values after all taxes and transaction costs.

The foreign country assesses taxes separately on capital gains in local currency and on dividends. Let us use CL_i and DY_i to denote the parts of the U.S. investor's dollar return that are subject to the foreign country's capital gains and dividend taxation. CL_i and DY_i are given as follows:

$$CL_i = \left(\frac{I_i - I_{i,-1}}{I_{i,-1}}\right) \frac{e_i}{e_{i,-1}} \tag{2}$$

$$DY_i = \frac{D_i}{I_{i,-1}} \frac{e_i}{e_{i,-1}} \tag{3}$$

where I_i is the local currency price index of equity market i

e_i is the exchange rate measured as the dollar price of one unit of foreign currency

D_i are local currency dividends paid in market i during the period.

Note that in case of a dollar appreciation, i.e. $e_i < e_{i,-1}$, CL_i can be positive, even if the dollar price index remains unchanged or even falls. The capital gains and dividend tax base variables CL_i and DY_i are assumed to be random variables with means ECL_i and EDY_i and random terms ε_i^{ci} and ε_i^{dy} respectively.

Taking into account the various aspects of the tax system and transaction costs, we can now express the expected after-tax and after-transactions dollar return on equity in market i ER_i^a as follows

$$ER_i^a = (1-\tau_{us})\, G_i - \theta_c \tau_i^c ECL_i + (1-\theta_d \tau_i^d - \tau_{us})\, EDY_i - (1-\tau_{us})\, C_i \tag{4}$$

where

$$G_i = \frac{I_i e_i - I_{i,-1} e_{i,-1}}{I_{i,-1} e_{i,-1}}$$

The first term on the right hand side of (4) is the dollar capital gain net of U.S. taxes. The second term reflects the foreign capital gains tax, adjusted for the U.S. credit. The expression reflects that the U.S. Treasury taxes dollar capital gains, while the foreign treasury taxes capital gains in its local currency. The third term is the dividend yield, net of U.S. and foreign taxes, again adjusted for the tax credit. The final term is the net transaction costs, where transactions costs C_i are assumed to be deductible from U.S. income taxes.

Generally transactions costs C_i in country i are a reflection of a number of country specific factors. Specifically, let us assume that C_i are affected by a vector of country characteristics X_i.

In the empirical work, the vector X_i will consist of a range of country dummies, the rate of inflation, a qualitative index of dividend repatriation restrictions, and linear and squared terms in the $(MCAP/Y)_i$ variable, which is the ratio of a country's equity market capitalization to GDP. The latter variable proves to be a good index of a country's equity market development. Transactions costs C_i are related to the vector X_i in the following straightforward linear fashion

$$C_i = \delta X_i \tag{5}$$

Combining (1), (4) and (5), the asset pricing relationship (1) can be restated in terms of pre-tax equity returns as follows

$$R_i - R = \beta_i (R_m^b - R) + \overline{\theta}_c TAXC_i + \overline{\theta}_d TAXD_i + \delta X_i + \eta_i \tag{6}$$

where R_i is the before-tax and before-transaction costs dollar return on equity market i

R_m is the before-tax, but after-transaction costs dollar return on the overall world portfolio

$TAXC_i = \tau_i^c CL_i$

$TAXD_i = \tau_i^d DY_i$

$\overline{\theta}_c = \dfrac{\theta_c}{1-\tau_{us}}$

$\overline{\theta}_d = \dfrac{\theta_d}{1-\tau_{us}}$

$\eta_i = \beta i_m + \overline{\theta}_c \tau_i^c e_i^{ci} + \overline{\theta}_d \tau_i^d e_i^d$

The variables $TAXC_i$ and $TAXD_i$ are the per period foreign capital gains and dividend tax burdens per dollar invested in equity market i. The parameters $\overline{\theta}_c$ and $\overline{\theta}_d$ indicate the extent to which the U.S. investor is compensated for these tax burdens by way of a higher pre-tax rate of return R_i. In deriving (6), use is made of the identity $R_i=G_i+DY_i$. Further, foreign taxes and corresponding U.S. tax credits for the world portfolio are ignored.[5] This implies that $R_m^a-R=(1-\tau_{us})(R_m-R)$. Finally, the world return R_m is assumed to be a random variable with mean ER_m and a random part ϵ_m.

The foreign country capital gains tax base CL_i represents real capital gains as well as purely inflationary gains. Hence, it is possible to divide CL_i into separate real and nominal parts, denoted CR_i and CN_i, as follows

$$CL_i=CR_i+CN_i \tag{7}$$

with

$$CR_i=\frac{I_i/P_i-I_{i,-1}/P_{i,-1}}{I_{i,-1}/P_{i,-1}}\frac{e_i}{e_{i,-1}} \tag{8}$$

$$CN_i=\frac{P_i-P_{i,-1}}{P_{i,-1}}\frac{e_i}{e_{i,-1}} \tag{9}$$

In (8) and (9), P_i stands for country i's goods price index.[6] The division of CL_i into CR_i and CN_i allows us to estimate possibly different incidence rates of the foreign capital gains tax as applied to strictly real and purely inflationary capital gains. CR_i and CN_i are assumed to have random components ϵ_i^{cr} and ϵ_i^{cn}. In particular, let $\overline{\theta}_{cr}$ and $\overline{\theta}_{cn}$ be the incidences of the capital gains tax applied to real and inflationary gains for the U.S. investor (divided by 1 - τ_{us}). After substituting

for CL_i from (7) and allowing for different incidence parameters $\overline{\theta}_{cr}$ and $\overline{\theta}_{cn}$, (6) now can be restated as follows

$$R_i - R = \beta_i (R_m - R) + \overline{\theta}_{cr} TAXCR_i + \overline{\theta}_{cn} TAXCN_i + \overline{\theta}_d TAXD_i + \overline{\eta}_i \qquad (10)$$

with

$$TAXCR_i = \tau_i^c CR_i$$

$$TAXCN_i = \tau_i^c CN_i$$

$$\overline{\eta}_i = \beta_i \varepsilon_{r,} + \overline{\theta}_{cr} \tau_i^c e_i^{cr} + \overline{\theta}_{cn} \tau_i^c e_i^{cn} + \overline{\theta}_d \tau_i^d e_i^d$$

Section 4 presents the estimation results for both equations (6) and (10).

3. The data

The data set consists of monthly observations for the period January 1987 - April 1992 for 18 developing countries with emerging equity markets. The stock market data is from the Emerging Markets Data Base constructed by the International Finance Corporation. The stock market returns numbers are for market indices computed by the International Finance Corporation itself. These IFC indices comprise a representative group of firms and are weighted by market capitalization.[7] The advantage of the IFC indices over local market indices is their consistency and comparability across countries. The Appendix provides an account of data sources and variable definitions.

Information on mean stock market returns and other variables for each of the 18 countries is given in Table 1. The variable R again is the dividend-inclusive monthly return in dollars, while G just measures dollar capital appreciation. Foreign countries of course tax capital gains as denominated in their own currencies rather than in dollars. The variable CL consequently measures

the part of the dollar return that is subject to the foreign capital gains tax. CR and CN are the parts of CL that are due to real and purely inflationary capital gains (see the Appendix for algebraic expressions of all derived variables).

The table shows that dollar rates of return for most countries have been very favorable during the period. Argentina and Brazil in particular experience monthly dollar rates of return of around 9 and 5 per cent for the more than five year period. The domestic currency capital gains measure CL and its inflationary part CN have been high as well, especially for the Latin American countries. The capital gains related variables throughout are computed on the assumption that gains are realized at the end of each month.

The variables TAXC, TAXCR, and TAXCN measure the monthly dollar tax burdens per dollar invested associated with the capital gains tax base measures CL, CR and CN. The tax burden TAXCN associated with merely inflationary capital gains is closely linked to the rate of inflation, INF. The variable TAXD instead measures the monthly dollar tax burden per dollar invested stemming from the witholding tax on dividends. This tax burden is small for most countries compared to the capital gains tax liabilities.

The variable MCAP/Y stands for the market capitalization of a country's stock market as a percentage of GDP. According to this measure, equity markets are most important in Malaysia, with a MCAP/Y ratio of 0.91. This is similar to the ratio for the United States.[8] Chile, Jordan, and Korea, have relatively important stock markets as well, with market capitalization to GDP ratios close to 0.5.

The variable τ_c is the capital gains withholding tax rate imposed on U.S. investors at the beginning of 1991.[9] The tax rates reflect the bilateral treaties between the U.S. and developing countries where they exist. Most countries do not index their capital gains tax for inflation, and the tax rates underlying the table apply to all nominal gains.[10] The tax rate τ_d is the dividend

withholding tax rate for a U.S. investor at the beginning of 1991. Only Mexico, Malaysia, Jordan and Turkey are shown to refrain from taxing tax U.S. portfolio investment altogether. The tax rates, if positive, tend to be higher than the (treaty) dividend tax rates imposed on U.S. investors by most developed countries.

Summary data for the years 1987-1991 and all countries combined are given in Table 2. The dollar return figures R and G confirm that for these years on average emerging stock markets have performed very well. Interestingly, average market capitalizations as a percentage of GDP rose from 15.5 per cent in 1988 to 29.1 per cent in 1991. This development reflects the increasing importance of equity markets in developing countries, as well as the generally large rates of appreciation during the period. The average capital gains withholding tax rate is shown to be rather stable between 12 and 15 per cent. The average dividend witholding tax rate, however, has progressively declined from around 20 per cent in 1988 to around 16 per cent in 1991.

4. Empirical results

This section presents tests of how dividend and capital gains taxes on non-residents affect the rates of return on emerging stock markets. Each regression is first performed using ordinary least squares. Equations (6) and (10), however, suggests the presence of heteroskedasticity across countries. To correct for this, all equations are also estimated using weighted-least squares, with the OLS residuals used to construct the weights.

Equations (6) and (10) are first estimated with the rate of dollar appreciation G_t rather than the dividend-inclusive return R_t as the dependent variable. The reason is that the dividend-yield in the data base can not be used for high inflation countries. The dividend yield is computed on a 12 month rolling basis, with a the domestic currency price index at the beginning of the 12-month period. As a result, available dividend yields are unrealistically high for high inflation countries.

Table (3) presents the regression results. The OLS and weighted least squares regressions are marked U and W respectively. All regressions allow for (unreported) country-specific β_i parameters and fixed effects. The world portfolio return is measured as the average of the dividend-inclusive S&P 500 index and the Morgan Stanley world index. The risk-free dollar return R is approximated by the 3-months U.S. T-bill rate. The inflation variable, INF, is included in the regression to test for an inflationary impact on equity returns independently of its implications for an investor's capital gains tax liability. All regressors reported in the table apart from INF are lagged a month to account for endogeneity. The regressions in columns (1)-(4) are in terms of actual returns, while column (5) is in terms of excess returns.

The regressions in column (1) represent the base case of equation (10) minus the TAXD variable. The results first indicate that the stock market return is related negatively to MCAP/Y, which suggests that the costs of investing in a country's equity market decline with its market size/GDP ratio. The estimated coefficient of -0.125 for the MCAP/Y variable implies that an increase in the stock market capitalization/GDP ratio by one reduces the required monthly dollar return by 0.125 per cent, and the annual return by 1.5 per cent. This empirical relationship could reflect that a more sizable stock market - relative to GDP - results in higher liquidity and lower transaction costs. The relationship can also be a reflection of cross-country variation in disclosure or other rules that affect an investor's costs in gathering information and protecting his investments.

Some alternative indicators of equity market development such as qualitative information regarding the quality of accounting standards, the existence of a government agency concentrating on regulating market activity and the extent of investor protection generally proved not to significantly affect stock market returns.[11]

The $\bar{\theta}_{cr}$ and $\bar{\theta}_{cn}$ parameters are estimated at around 0.3 and 1.0 respectively. To arrive at the underlying incidence rates θ_{cr} and θ_{cn}, these numbers have to be multiplied by $1-\tau_{us}$ or roughly 2/3.

The resulting figures of 0.2 and 0.66 respectively indicate the foreign investor has to be partially compensated by way of higher equity returns for capital gains taxes paid abroad. At least partial compensation is consistent with the absence of offsetting tax credits provided by the U.S. and other developed country treasuries.

Unlike the model of section 2, the investor operates in a multi-period world. As a result, two difficulties arise in interpreting the estimates of θ_{cr} and θ_{cn} coefficients as incidence shares that do not emerge in a single period world. First, the investor's asset holding period does not necessarily correspond to a month. Hence, the estimated coefficients on the TAXCR and TAXCN variables more closely correspond to the increase during the month in the present value of the capital gains tax to be paid at some time in the future. Clearly the present value of a tax to be realized at some time in the future is less than its present value if paid today. If follows that the deferment of capital gains taxes lowers the estimated coefficients, regardless of the actual incidence rates. A second difficulty is that the estimated coefficients may also reflect additional information obtained during the month on tax liabilities to be incurred in the future. For instance, higher inflation today may generally imply higher inflation tomorrow. If so, the coefficient on the TAXCN variable reflects the tax burden associated with a higher capital gains liability incurred today as well tomorrow. Persistence in inflation hence occasions a larger coefficient $\overline{\theta}_{cl}$ during an initial inflationary period. The first difficulty in interpreting the results may be more systematic than the second. Hence, the estimated incidence rates on the domestic economy, as represented by θ_c and θ_d, probably underestimate the true incidences.

The DIVREST variable is a dummy variable that equals one if the country imposes any restrictions on the repatriation of dividends, and it is zero otherwise. The variable enters the regression negatively, which suggests these restrictions lower the pre-tax return on equity. A possible reason is that repatriation restictions force investors to remain invested in the country to a larger

extent than is desirable. Trapped dividends may then have to be invested in low return projects, which explain the negative relationship between equity returns and repatriation restrictions.

Finally the negative coefficient on the INF variable suggests that inflation lowers the return on equity for reasons independent of the capital gains taxes.

Initial advances in equity market development, as proxied by an increasing MCAP/Y variable from an initial low level, should be expected to lower the required return considerably. However, one expects the relationship between the MCAP/Y variable and equity returns to become less pronounced at higher levels of stock market development. To test this hypothesis, the regressions in column (2) include a squared term in the MCAP/Y variable. The positive estimated coefficient is in support of the hypothesis. The linear and squared MCAP/Y coefficients together suggest that with MCAP/Y = 0 at the margin an increase in MCAP/Y lowers the required rate of return about twice as much as at MCAP/Y = 0.5.

The regressions in column (3) more closely corresponds to equation (6). It has a single tax burden TAXC associated with the capital gains tax. The estimated coefficient is 0.337, in between the coefficients on the TAXCR and TAXCI variables in previous regressions.

As mentioned, it is generally unclear when (if ever) a foreign investor will repatriate his intial investment along with accumulated capital gains. The assumption so far that all capital gains are realized each month clearly is an extreme assumption. At the other extreme, one can assume that capital gains never are realized. In that case all returns, present and future, will be repatriated as dividends. For this case, the dividend tax burden can be approximated as if the capital gains during a period were in fact paid out as dividends in that period. This procedure is correct if a capital gain represents the exact increase in the present value of future dividends during the period, and if the dividend tax withholding tax were not to change over time. For this case, the TAXR variable represents the present value of all the dividend tax liability incurred during the period. The

coefficient on the TAXR variable in the unweighted regression in column (4) is positive but insignificant. It is somewhat larger and significant in the weighted regression.

Finally in column (5) the dependent variable is taken to be the excess return on a developing country stock market, measured as the rate of appreciation of the IFC dollar index minus the 3-months U.S. T-bill interest rate. In other respects the regressions are as in column (2). The overall results are very similar to those reported before.

Table 4 presents regression results where the dependent variable is the dividend-inclusive dollar return. The sample now excludes the Latin American countries, as the dividend yield reported is distorted for high inflation countries. The regressions now include the TAXD variable. Otherwise they are as those in Table 3. Column (1) first shows that the estimated coefficient $\overline{\theta}_{c1}$ now equals 3.518, which is much larger than before. A reason may be that at lower levels of inflation, an increase in inflation is more of a signal of future inflation. A second reason is that in low inflation countries investors are more likely to actually pay the capital gains tax at some point, while in high inflation countries the capital gains tax may prohibit selling to ever occur. Thus in high inflation countries assets may be completely locked in, with capital gains never realized. In this environment, higher inflation has little impact on the future real capital gains tax burden.

The TAXD variable enters with a positive but insignificant coefficient throughout, in contrast to the coefficients on the capital gains tax burden variables TAXCR and TAXCN. A reason for the insignificant coefficient for the TAXD variable may be that the non-resident investor generally can obtain an off-setting tax credit for dividend withholding taxes paid abroad. Also note that the INF variable is no longer significant. Other regressions in the table are modified in similar ways. The TAXC and TAXR variables, however, are now significant throughtout.

5. Conclusion

This paper has examined to what extent features of the international tax system and indicators of transaction costs affect the required rates of return on emerging stock markets. The capital gains withholding tax levied on foreign portfolio investors is shown to increase pre-tax required rates of return. As countries generally do not index their capital gains taxes, it follows that inflation increases the capital gains tax base, and also the required rate of return on equity. Dividend withholding taxes instead appear not to significantly increase pre-tax equity returns. The differing results for capital gains and dividend taxes reflect the fact that foreign investors generally can receive domestic tax credits only for foreign withholding taxes paid on dividends.

The return on equity is part of the issuing firm's cost of capital. Hence, capital gains withholding taxes imposed on non-residents increase the cost of capital for domestic firms, and discourage physical investment. Private sector investment levels have tended to be low in developing countries in the 1980s. The cost of equity finance in developing countries has gained in importance in the last decade, as these countries' access to international lending capital has been limited during most of the decade.

The results of this paper have immediate implications for the design of tax policy related to foreign portfolio investment in developing countries. The existence of foreign tax credits for dividend taxes paid suggests a country should tax capital gains lightly in comparison to repatriated dividends. This is the policy pursued by Greece, Pakistan, Portugal and Venezuela. Each of these countries has positive dividend withholding taxes but no capital gains taxes imposed on non-residents. Colombia and India, however, do the exact opposite: they tax capital gains heavily compared to dividends. Contrary to what appears optimal, the trend in developing countries is towards lower dividend withholding taxes according to Table 2, with little change in the average level of capital gains taxation. Also, it appears desirable for developing countries to index their capital gains taxes to prevent them from being higher than anticipated.

While developing countries may not have eliminated the taxation barriers to foreign portfolio investment, they have taken steps to improve overall foreign access to the domestic equity market in other important ways. Some countries have encouraged foreign equity participation through debt equity swaps, and through the establishment of country equity funds. Also, foreign ownership restrictions and repatriation restrictions on dividend and capital returns have generally been relaxed over the last decade.

The result that capital gains taxes increase the required pre-tax return on portfolio investment in emerging equity markets should hold equally for developed countries. Hence, a capital gains tax cut for U.S. equities (rather than U.S. citizens) can be expected to lower the required rate of return on U.S. equities, with a concomittant reduction in the cost of capital of U.S. firms.[12] It is probably impossible, however, to infer the impact of capital gains taxes on equity returns for a single country, as there may be too little variation in the capital gains tax rate. For the developed countries as a whole, however, tests similar to those in this paper should be possible.

Apart from taxes, there are other costs to investors associated with investments in a particular country for which they need to be compensated. A country's market capitalization to GDP ratio is shown to be a good indicator of these costs. In particular, the equity return in a country is negatively related to the equity market's market capitalization to GDP ratio. The data, however, do not reveal whether this relationship is due to variation in direct transactions costs or whether a high market capitalization/GDP ratio reflects favorable equity market practices in the form of disclosure and other rules and regulations.

References

Black, Fischer, International Capital Market Equilibrium with Investment Barriers, Journal of Financial Economics 1, 337-352, 1974.

Bonser-Neal, Catherine, Greggory Brauer, Robert Neal and Simon Wheatley, International Investment Restrictions and Closed-End Country Fund Prices, Journal of Finance 45, 523-547, 1990.

Booth, Lawrence, The Dividend Tax Credit and Canadian Ownership Objectives, Canadian Journal of Economics 20, 321-339, 1987.

Cho, D. Chinhyung, Cheol S. Eun, and Lemma W. Senbet, International Arbitrage Pricing Theory: An Empirical Investigation, Journal of Finance 41, 313-329, 1986.

Eun, Cheol S. and S. Janakiramanan, A Model of International Asset Pricing with a Constraint on the Foreign Equity Ownership, Journal of Finance 40, 105-124, 1986.

Dailami, Mansoor, Financial Policy and Corporate Investment in Imperfect Capital Markets: The Case of Korea, PRE Working Paper no. 409, World Bank, 1990.

'Doing Business in ..,' for various countries and years, Price Waterhouse.

Errunza, Vihang and Etienne Losq, Capital Flows, International Asset Pricing, and Investors' Welfare: A Multi-Country Framework, Journal of Finance 44, 1025-1037, 1989.

Gultekin, Mustafa, N. Bulent Gultekin, and Alessandro Penati, Capital Controls and International Capital Markets Segmentation: The Evidence from the Japanese and American Stock Markets, Journal of Finance 44, 849-869, 1989.

Hietala, Pekka, Asset Pricing in Partially Segmented Markets: Evidence from the Finnish Market, Journal of Finance 44, 697-718, 1989.

Huizinga, Harry, Withholding Taxes and International Bank Interest Rates, mimeo, Stanford University, 1991.

Jorion, Phillip and Eduardo Schwartz, Integration vs. Segmentation in the Canadian Stock Market, Journal of Finance 41, 603-613, 1986.

Lintner, J., The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets, Review of Economics and Statistics 47, 13-37, 1965.

Sharpe, William H., Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk, Journal of Finance 19, 425-442, 1964.

Singh, Ajit, Javed Hamid, Bahram Salimi and Yoichi Nakano, Corporate Financial Structures in Developing Countries, Technical Paper no. 1, International Finance Corporation, 1992.

Stehle, Richard E., An Empirical Test of the Alternative Hypotheses of National and International Pricing of Risky Assets, Journal of Finance 32, 493-502, 1977.

Stulz, René, On the Effects of Barriers to International Investment, Journal of Finance 36, 923-934, 1981.

Wheatley, Simon, Some Tests of Barriers to International Investment, Journal of Financial Economics 21, 177-212, 1988.

Endnotes

1. The limitations of this assumption for the empirical work are discussed in section 4.

2. In addition, interest is not taxed and cannot be expensed abroad. These assumptions sidestep existing national rules for allocating interest expense to different income sources.

3. U.S. foreign tax credits can only be used to offset U.S. taxes on foreign source income in the same income basket.

4. The securities that comprise an equity market are taken to be a single asset. Hence, this paper abstracts from selective investments in foreign equity markets.

5. This is because it is difficult to accurately compute the appropriate withholding tax rates. Similarly, transaction costs associated with holding the market portfolio are ignored in the empirical work.

6. In the empirical work, P_i is taken to be the consumer price index.

7. For information on the method of construction of the IFC indices, see the Emerging Stock Markets Factbook 1991, pp. 78-79.

8. The value of U.S. corporate stock at the end of 1987 was 4,315 billion dollars, while U.S. GDP for 1987 was 4,497 billion, with a ratio of 0.96.

9. Capital gains tax rates for domestic residents display a close correlation with those imposed on foreign residents. Nigeria, for instance, has a flat capital gains tax of 20 per cent imposed on residents as well as non-residents. A number of countries, such as Brazil, Chile, Mexico, Venezuela, India and Korea tax capital gains as ordinary income, and hence the marginal tax rate depends on the person's income level. Chile and Mexico allow for adjustments of capital gains for inflation. Colombia and Turkey distinguish between short term (less than 2 and 1 years respectively) and long term capital gains. Short term capital gains are counted as ordinary income, while long term capital gains are taxed at a lower rate. Argentina has no capital gains tax for marketable securities for residents, even though it taxes capital gains accruing to foreign residents. Malaysia, Portugal and Greece do not tax domestic capital gains. Sources: latest country guides of the 'Doing Business in ..' series of Price Waterhouse.

10. This means that capital gains withholding tax rates for Argentina and Chile for the years 1990-1991 and 1987-1989 respectively in which only inflation-adjusted capital gains were taxed are excluded.

11. These unreported results only demonstrate that these additional indicators of market development do not affect returns on financial capital. The results, however, do not rule out that the indicators are related to the returns on physical investment if they in part reflect the cost structure of the firm.

12. Of course, the relationship between the capital gains tax and equity returns is only one aspect of a larger debate that includes the overall distributive implications.

Table 1. Emerging Stock Markets -- Descriptive Statistics by Country.

Country	R	G	CL	CR	CN	INF	TAXC	TAXCR	TAXCN	TAXD	MCAP/Y	τ^c_{1991}	τ^d_{1991}
Latin America													
Argentina	.094	.094	.206	.055	.178	.246	.086	.024	.044	.000	.019	36	17.5
Brazil	.053	.053	.229	.039	.186	.240	.018	.006	.009	.000	.080	25	25
Chile	.041	.036	.043	.027	.015	.015	.012	.007	.002	.0018	.449	10	10
Colombia	.031	.027	.047	.027	.021	.021	.012	.008	.005	.0006	.033	30	0
Mexico	.052	.050	.057	.034	.022	.022	.000	.000	.000	.0004	.127	0	0
Venezuela	.036	.035	.050	.024	.032	.032	-.000	.000	.000	.0001	.081	0	20
Asia													
India	.029	.028	.042	.022	.008	.008	.013	.009	.003	.0004	.110	40	25
Indonesia	-.018	-.012	-.008	-.023	.008	.006	-.002	-.005	.002	.000	.059	20	20
Korea	.005	.004	.003	-.001	.006	.006	-.001	.000	.000	.0002	.444	0	25
Malaysia	.016	.014	.014	.011	.003	.003	.000	.000	.000	.0003	.931	0	0
Pakistan	.024	.019	.026	.023	.008	.008	.000	.000	.000	.0007	.074	0	15
Thailand	.020	.017	.018	.011	.004	004	.002	.000	.001	.0006	.259	25	20
Europe/Mideast/Africa													
Greece	.018	.015	.023	.009	.013	.014	.003	.001	.002	.0014	.128	0	42
Jordan	.002	-.002	.010	-.002	.011	.012	.000	.000	.000	.000	.507	0	0
Nigeria	.008	.003	.027	.007	.023	.024	.005	.001	.005	.0009	.035	20	15
Portugal	-.006	-.008	-.007	-.017	.009	.009	.000	.000	.000	.0004	.174	0	25
Turkey	-.009	-.012	.023	-.013	.042	.043	.004	.003	.001	.0003	.091	0	0
Zimbabwe	.002	-.003	.019	.014	.014	.014	.006	.004	.004	.0009	.205	30	20

For variables R, G, CL, TAXC, and TAXD the reported values are means for the period 1988-1992. For τ^c and τ^d 1991 values are reported. The means for the rest of the variables do not include 1992 observations. Variable definitions and sources are given in the Appendix.

Table 2. Emerging Stock Markets -- Descriptive Statistics by Year.

	1988	1989	.990	1991
R	.013	.043	.018	.030
G	.016	.039	.009	.028
CL	.037	.074	.035	.049
CR	.002	.030	.002	.025
CN	.032	.043	.038	.023
INF	.034	.056	.045	.025
TAXC	.006	.016	.006	.011
TAXCR	.001	.007	.000	.006
TAXCN	.004	.008	.002	.003
TAXD	.001	.001	.001	.000
MCAP/Y	.155	.199	.229	.291
τ^c	12.237	13.289	14.778	13.111
τ^d	20.033	19.612	21.700	15.528

Reported are the yearly mean values for the countries in the sample (see Table 1). Variable definitions and sources are given in the Appendix.

Table 3. Rate of Return Regressions for Emerging Markets -- Excluding Dividends.

	(1)		(2)		(3)		(4)		(5)	
	U	W	U	W	U	W	U	W	U	W
MCAP/Y	-.126* (.053)	-.119** (.016)	-.341** (.119)	-.340** (.030)	-.328** (.120)	-.328** (.033)	-.325** (.120)	-.317** (.037)	-.271* (.120)	-.338** (.038)
$(MCAP/Y)^2$			.176* (.087)	.175** (.022)	.170# (.087)	.169** (.023)	.167# (.088)	.162** (.026)	.136# (.087)	.156** (.025)
TAXCR	.291# (.159)	.278** (.007)	.302# (.159)	.292** (.066)					.320* (.160)	.338** (.074)
TAXCN	1.049** (.312)	1.055** (.157)	1.060** (.312)	1.062** (.154)					.989** (.313)	1.018** (.152)
INF	-.163** (.063)	-.114** (.044)	-.163** (.062)	-.115** (.042)	-.120# (.063)	-.096** (.031)	-.035 (.053)	-.017 (.038)	-.181** (.063)	-.092# (.048)
TAXC					.350** (.134)	.337** (.060)				
TAXR							.117 (.163)	.193** (.061)		
DIVREST	-.049** (.016)	-.048** (.006)	-.056** (.017)	-.057** (.006)	-.047** (.016)	-.050** (.005)	-.045** (.017)	-.047** (.006)	-.055** (.017)	-.060** (.006)
NO OBS.	810									
R^2	.11	.48	.11	.65	.10	.67	.09	.49	.11	.49

The dependent variable is G, the dollar rate of return, in specifications 1-4, and the excess rate of return in the last specification. Rate of return is defined as the percentage change in the dollar price index and does not include dividends. Not reported above are country dummy variables. Regressions also include the world rate of return (excess return in specification 5), with a coefficient that is alowed to vary across countries. All reported regressors other than INF are lagged one month. Columns U and W report OLS and weighted-OLS results of the same specification, where the residuals of the OLS regression are used to construct the weights. Standard errors are given in parentheses. **, *, and # indicate that the coefficient is significantly different from zero at 1, 5, and 10 percent levels respectively. Variable definitions and sources are given in the Appendix.

Table 4. Rate of Return Regressions for Emerging Markets -- Including Dividends.

	(1)		(2)		(3)		(4)		(5)	
	U	W	U	W	U	W	U	W	U	W
MCAP/Y	-.153** (.043)	-.146** (.012)	-.458** (.095)	-.443** (.036)	-.443** (.096)	-.422** (.035)	-.444** (.094)	-.415** (.038)	-.417** (.096)	-.409** (.0377)
$(MCAP/Y)^2$			.230** (.064)	.221** (.023)	.222** (.065)	.209** (.021)	.223** (.064)	.208** (.025)	.206** (.064)	.194** (.024)
TAXCR	.604** (.239)	.573** (.115)	.620** (.236)	.636** (.130)					.578** (.235)	.641** (.133)
TAXCN	3.519** (1.271)	3.107** (.502)	3.754** (1.257)	3.156** (.666)					3.732** (1.257)	2.504** (.645)
INF	-.177 (.243)	-.141# (.087)	-.135 (.240)	-.098 (.088)	-.053 (.239)	-.055 (.080)	-.055 (.239)	-.066 (.080)	-.133 (.247)	-.033 (.103)
TAXD	3.560 (5.367)	2.958 (2.347)	.531 (5.373)	.780 (1.293)	-.182 (5.394)	.511 (2.118)			.526 (5.385)	2.023 (2.172)
TAXC					.666** (.233)	.715** (.118)				
TAXR							.481** (.176)	.433** (.093)		
DIVREST	-.057** (.014)	-.054** (.006)	-.065** (.014)	-.063** (.005)	-.065** (.014)	-.064** (.004)	-.062** (.014)	-.060** (.005)	-.065** (.014)	-.065** (.005)
NO OBS.	514									
R^2	.15	.59	.17	.60	.16	.66	.16	.84	.17	.56

The dependent variable is R, the rate of return, in specifications 1-4, and ER, excess rate of return in the last specification. Not reported above are country dummy variables. Regressions also include the world rate of return (excess return in specification 5), with a coefficient that is allowed to vary across countries. All reported regressors apart from INF are lagged one month. The sample excludes Latin American countries. Columns U and W report OLS and weighted-OLS results of the same specification, where the residuals of the OLS regression are used to construct the weights. Standard errors are given in parentheses. **, * and # indicate that the coefficient is significantly different from zero at 1, 5 and 10 percent levels, respectively. Variable definitions and sources are given in the Appendix.

Appendix: Variable Definitions and Sources

Basic variables:

I_i: Foreign currence IFC equity market index

D_i: Foreign currency dividend return on IFC index

P_i: Foreign price index at end of period

e_i: Exchange rate expressed as dollars per unit of foreign currency

τ_i^c: Capital gains withholding tax rate for U.S. investors

τ_i^d: Dividend withholding tax rate for U.S. investors

$MCAP_i$: Equity market capitalization in foreign currency

Y_i: GDP in foreign currency

R_m^b: World portfolio return in dollars, computed as average of S&P 500 and the Morgan Stanley world index

R: Risk-free rate of return in U.S. dollars measured as 3-month U.S. T-Bill rate

$DIVREST_i$: Dummy variable equal to one if the country in any way restricts the repatriation of dividends, and zero otherwise

Derived Variables:

$$R_i=\frac{I_i+D_i}{I_{i,-1}}\frac{e_i}{e_{i,-1}}-1:$$

Dividend inclusive dollar return on equity market i

$$G_i=\frac{I_i e_i}{I_{i,-1}e_{i,-1}}-1:$$

Rate of appreciation of dollar price index of market i

$ER_i = R_i - R$:

Dollar dividend-inclusive excess return on equity market i

$INFi = \frac{P_i - P_{i,-1}}{P_{i,-1}}$:

Rate of inflation

$CL_i = \frac{I_i - I_{i,-1}}{I_{i,-1}} \frac{e_i}{e_{i,-1}}$:

Part of the dollar return on equity market i that is subject to capital gains tax in country i

$CR_i = \frac{I_i/P_i - I_{i,-1}/P_{i,-1}}{I_{i,-1}/P_{i,-1}} \frac{e_i}{e_{i,-1}}$ and $CN_i = INFi \frac{e_i}{e_{i,-1}}$:

Parts of CL_i that are due to real and purely inflationary capital gains in country i

$TAXC_i = \tau_i^c * CL_i$:

Capital gains tax in dollars assessed per dollar invested in country i

$TAXCR_i = \tau_i^c * CR_i$ and $TAXCN_i = \tau_i^c * CN_i$:

Parts of $TAXC_i$ due to real and purely inflationaly capital gains

$DY_i = \frac{D_i e_i}{I_{i,-1} e_{i,-1}}$:

Dollar dividend yield

$TAXD_i = \tau_i^d * DY_i$:

Dividend tax in dollars assessed on U.S. investor per dollar invested in country i

$TAXR_i = \tau_i^d * R_i$:

Dividend tax in dollars assessed on U.S. investor per dollar invested if all returns were repatriated as dividends

Data Sources:

$I_i, D_i, e_i, MCAP_i$:

Emerging Markets Data Base, International Finance Corporation

P_i, Y_i, R:

International Finance Statistics, International Monetary Fund

$\tau_i^c, \tau_i^d, DIVREST_i$:

Emerging Stock Market Facts Book, International Finance Corporation, various issues

R_m^b:

Morgan Stanley, and Standard and Poor

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS963	Growth and Welfare Losses from Carbon Emissions Restrictions: A General Equilibrium Analysis for Egypt	Charles R. Blitzer R. S. Eckaus Supriya Lahiri Alexander Meeraus	August 1992	WDR Office 31393
WPS964	Toxic Releases by Manufacturing: World Patterns and Trade Policies	Robert E. B. Lucas	August 1992	WDR Office 31393
WPS965	Coping with the Disappointing Rates of Return on Development Projects That Affect the Environment	William Ascher	August 1992	WDR Office 31393
WPS966	Trade and the Environment: A Survey of the Literature	Judith M. Dean	August 1992	WDR Office 31393
WPS967	Transition Problems in Economic Reform: Agriculture in the Mexico-U.S. Free Trade Agreement	Santiago Levy Sweder van Wijnbergen	August 1992	M. Stroude 38831
WPS968	Biomass	David O. Hall	August 1992	WDR Office 31393
WPS969	Imports, Exports, and Industrial Performance in India, 1970-88	M. Ataman Aksoy Helena Tang	August 1992	M. Shore 31129
WPS970	Political Models of Macroeconomic Policy and Fiscal Reform	Alberto Alesina	August 1992	E. Khine 39361
WPS971	The Effects of Democratic Determination of Wages: Theory and Evidence from Self-Managed Firms	Milan Vodopivec	August 1992	CECTM 37188
WPS972	Commercial Energy Efficiency and the Environment	Robin W. Bates Edwin A. Moore	September 1992	WDR Office 31393
WPS973	How Changes in the Former CMEA Area May Affect International Trade in Manufactures	Refik Erzan Christopher Holmes	September 1992	G. Ilogon 33732
WPS974	How Minilateral Trading Arrangements May Affect the Post-Uruguay Round World	C. A. Primo Braga Alexander Yeats	September 1992	J. Jacobson 33710
WPS975	Techniques for Improving Client Relations in Family Planning Programs	George B. Simmons Sara Koerber Ruth Simmons	September 1992	O. Nadora 31091
WPS976	Strategic Management of Family Planning Programs	Cynthia P. Green	September 1992	O. Nadora 31091

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS977	Income Security for Old Age: Conceptual Background and Major	Estelle James	September 1992	D. Evans 37489
WPS978	How Restricting Carbon Dioxide and Methane Emissions Would Affect the Indian Economy	Charles R. Blitzer R. S. Eckaus Supriya Lahiri Alexander Meeraus	September 1992	WDR Office 31393
WPS979	Economic Growth and the Environment	Dennis Anderson	September 1992	WDR Office 31393
WPS980	The Environment: A New Challenge for GATT	Piritta Sorsa	September 1992	WDR Office 31393
WPS981	After Socialism and Dirigisme: Which Way?	Andrés Solimano	September 1992	S. Falon 37947
WPS982	Microeconomics of Transformation in Poland: A Survey of State Enterprise Responses	Brian Pinto Marek Belka Stefan Krajewski	September 1992	S. Husain 37139
WPS983	Legal Reform for Hungary's Private Sector	Cheryl W. Gray Rebecca J. Hanson Michael Heller	October 1992	R. Martic 39065
WPS984	Barriers to Portfolio Investments in Emerging Stock Markets	Asli Demirgüç-Kunt Harry Huizinga	October 1992	W. Patrawimolpon 37664